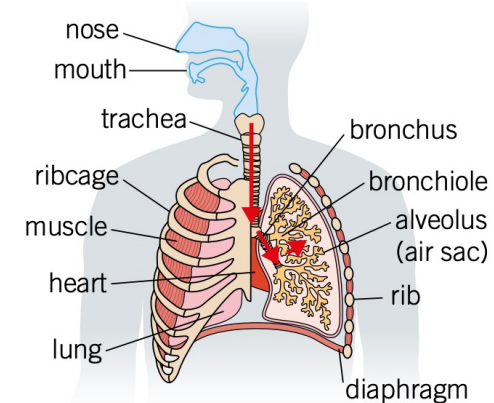


Must Remember

- Diffusion is the movement of particles from an area of high concentration to an area of low concentration.
- Temperature, surface area and membrane thickness can affect the rate of diffusion.
- Gas exchange takes place in the lungs – oxygen is taken in and carbon dioxide is given out.
- Oxygen enters through the mouth and nose. It then travels down the trachea, through a bronchus, then a bronchiole, into an alveolus, and diffuses into the blood.
- When you inhale, muscles between your ribs and the diaphragm contracts. This increases the volume inside your chest. The pressure decreases and air is drawn into the lungs.
- When you exhale, muscles between your ribs and the diaphragm relax. This decreases the volume inside your chest. The pressure increases and air is forced out of your lungs.
- Muscles work in pairs called antagonistic muscles.

Nice to know that...

- The respiratory system is involved in breathing in oxygen for respiration and breathing out carbon dioxide.



- Lung volume can be measured by breathing out through a tube inserted into a bottle full of water and determining how much water is pushed out of the tube/bottle.

Maritime Futures – Adaptations of Gills

Fish get oxygen from water by diffusion. However, water is much denser than air and so it is much more difficult for oxygen to diffuse from water into cells than from the air. For this reason, fish gills have many adaptations allowing them to get the oxygen they require. Gills are made of many small layers; this increases surface area so more diffusion can occur at one time. Gills are also very thin which reduces the diffusion distance. These adaptations allow fish to receive all the oxygen they require from water.

Further Study

[BBC Bitesize – Structure and function of the gas exchange system](#)

Key Terms

- **Alveolus:** A structure inside the lungs where gas exchange takes place with the blood.
- **Bronchioles:** Very small branches of bronchi that go deep into the lungs.
- **Bronchus:** A branch from the trachea taking air to one of the lungs.
- **Concentration:** The amount of substance or particles in a given space or volume.
- **Diaphragm:** The sheet of muscle used in breathing.
- **Diffusion:** The movement of particles from an area of high concentration to an area of low concentration.
- **Exhale:** Breathing out, to remove carbon dioxide.
- **Gas Exchange:** The transfer of gases between an organism and its environment.
- **Inhale:** Breathing in, to take in oxygen.
- **Respiration:** A chemical reaction where food and oxygen are converted into energy, water, and carbon dioxide.
- **Respiratory System:** The organs involved in gas exchange.
- **Trachea:** A large tube that takes air to the lungs (the windpipe).